Listing and Amendments to the Claims

This listing of claims will replace the claims that were published in the PCT Application:

1. (currently amended) A method for upconverting interlaced video to progressive video with a noise constrained diagonal enhancement, comprising the steps of:

determining, for a given output pixel, a vertical average ~~(y1V)~~, a left diagonal average ~~(y1L)~~, a right diagonal average ~~(y1R)~~, a vertical difference ~~(d1V)~~, a left diagonal difference ~~(d1L)~~ and a right diagonal difference ~~(d1R)~~;

selecting among the vertical average ~~(y1V)~~, the left diagonal average ~~(y1L)~~ and the right diagonal average ~~(y1R)~~ based on a minimal difference among the vertical difference ~~(d1V)~~, the left diagonal difference ~~(y1L)~~ and the right diagonal difference ~~(y1R)~~; and,

constraining the selecting step to the vertical average ~~(y1V)~~ if the left diagonal difference substantially equals the right diagonal difference ~~(d1L ≈ d1R)~~.

2. (currently amended) The method of claim 1, wherein the method further comprises the step of constraining the selecting step to the vertical average ~~(y1V)~~ if a value for the given output pixel (e.g., y13) is not between a range of values of a top pixel (e.g., x23) and a bottom pixel (e.g., x23) defining the vertical average for the given output pixel (e.g., $x23 < y13 < x13$).

3. (original) The method of claim 1, wherein the method further comprises the step of constraining the selection step to the vertical average if a value for the given output pixel is not between a range of values defined by an adjacent pixel above the given output pixel and an adjacent pixel below the given output pixel.

4. (original) The method of claim 1, wherein the vertical average is a obtained by adding a luminance component value of a vertically adjacent pixel above the given output pixel with a luminance component value of a vertically adjacent pixel below the given output pixel to form a sum which is divided by two.

5. (original) The method of claim 1, wherein the left diagonal average is obtained by adding a luminance component value of a diagonally adjacent pixel above and to the left of the given output pixel with a luminance component value of a diagonally adjacent pixel below and to the right of the given output pixel to form a sum which is divided by two.

6. (original) The method of claim 1, wherein the right diagonal average is obtained by adding a luminance component value of a diagonally adjacent pixel above and to the right of the given output pixel with a luminance component value of a diagonally adjacent pixel below and to the left of the given output pixel to form a sum which is divided by two.

7. (original) The method of claim 1, wherein the minimal difference among the vertical difference, the left diagonal difference and the right diagonal difference is determined by comparing absolute values of the vertical difference, the left diagonal difference and the right diagonal difference and selecting a minimum among the vertical difference, the left diagonal difference and the right diagonal difference.

8. (original) The method of claim 1, wherein the step of constraining comprises constraining the selection step to the vertical average if the left diagonal difference equals the right diagonal difference.

9. (original) The method of claim 1, wherein:

the vertical average is based on vertically adjacent pixels;

the left average is based on upper left and lower right diagonally adjacent pixels; and,

the right average is based on upper right and lower left diagonally adjacent pixels.

10. (original) The method of claim 9, wherein the step of selecting as an interpolated value for the given output pixel among the averages for the vertically adjacent pixels, the left diagonally adjacent pixels, and the right diagonally adjacent pixels is based on a minimal difference of an absolute value among the differences for the vertically adjacent pixels, the left diagonally adjacent pixels, and the right diagonally adjacent pixels respectively.

11. (currently amended) A deinterlacing circuit for upconverting interlaced video to progressive video, comprising:

means ~~(26, 28, 30)~~ for determining, for a given output pixel, a vertical average ~~(y1V)~~, a left diagonal average ~~(y1L)~~, a right diagonal average ~~(y1R)~~, a vertical difference ~~(d1V)~~, a left diagonal difference ~~(d1L)~~ and a right diagonal difference ~~(d1R)~~;

means ~~(32)~~ for selecting among the vertical average ~~(y1V)~~, the left diagonal average ~~(y1L)~~ and the right diagonal average ~~(y1R)~~ based on a minimal difference among the vertical difference ~~(d1V)~~, the left diagonal difference ~~(y1L)~~ and the right diagonal difference ~~(y1R)~~; and,

means ~~(44)~~ for constraining the selecting step to the vertical average ~~(y1V)~~ if the minimal difference is ambiguous.

12. (currently amended) The deinterlacing circuit of claim 11, wherein the minimal difference among the vertical difference ~~(d1V)~~, the left diagonal difference ~~(y1L)~~ and the right diagonal difference ~~(y1R)~~ is ambiguous if a value for the given output pixel is not between a range of values defined by an adjacent pixel above the given output pixel and an adjacent pixel below the given output pixel.

13. (currently amended) The deinterlacing circuit of claim 11, wherein the minimal difference among the vertical difference ~~(d1V)~~, the left diagonal difference ~~(y1L)~~ and the right diagonal difference ~~(y1R)~~ is ambiguous if the average values for the left diagonally adjacent pixels and the right diagonally adjacent pixels are substantially equal.

14. (original) The deinterlacing circuit of claim 11, wherein the determining, selecting and constraining means implement only a spatial deinterlacing.

15. (original) The deinterlacing circuit of claim 11, wherein the determining, selecting and constraining means implement a spatial estimate of a motion adaptive deinterlacing algorithm.